The Biometric Society

BIOMETRICS

FOUNDED BY THE BIOMETRICS SECTION OF THE AMERICAN STATISTICAL ASSOCIATION

VOLUME 33: 1977

Number 1-4

Published Quarterly by

THE BIOMETRIC SOCIETY

RALEIGH, NORTH CAROLINA

1977

BIOMETRICS

Editor

Foster B. Cady

Associate Editors

David M. Allen
Richard G. Cornell
Joseph L. Fleiss
John J. Gart
William G. Hill
Klaus Hinkelmann
Oscar Kempthorne
Gary G. Koch
Lynn R. LaMotte
C. A. McGilchrist
Carl M. Metzler
H. D. Patterson
John O. Rawlings
Arthur A. Rayner
Daniel L. Solomon
William G. Warren
Wilfred J. Westlake

Business Manager

Larry A. Nelson

Editor for Shorter Communication

J. S. Williams

Book Review Editor

R. M. Cormack

Editorial Assistants

Lee E. Kresge
Norma E. Phalen

French Translators

Dr. R. Tomassone and members of the French Section of the Biometric Society

Subject Index

Miles Davis

Editorial Board

H. A. David (Chairman), L. C. A. Corsten, P. Dagnelie, G. G. Duarte, F. A. Graybill, I. Juvancz, E. Marubini, S. R. Searle, M. Tarter, R. Tomassone, E. J. Williams, M. E. Wise

Former Editors

Gertrude M. Cox (1945–55)—*Founding Editor*
John W. Hopkins (1955–7)
Ralph A. Bradley (1957–62)
Michael R. Sampford (1962–7)
Herbert A. David (1967–72)
Franklin A. Graybill (1972–5)

Published quarterly by the BIOMETRIC SOCIETY

EDITORIAL OFFICE OF *BIOMETRICS:* Correspondence about editorial matters should be sent to the Editor Foster B. Cady, Biometrics Unit, 337 Warren Hall, Cornell University, Ithaca, New York 14853, U.S.A.

BUSINESS OFFICE: All correspondence about subscriptions, single copies, changes of address, claims for missing issues, and membership should be sent to the Business Manager, Biometrics Business Office, P.O. Box 5962, Raleigh, North Carolina 27607, U.S.A. Members of the Biometric Society should also advise their respective Regional or National Secretaries (for addresses, see page ix) of changes of address to insure receipt of notices of meetings, ballots, and all dues notices.

Second-class postage paid at Richmond, Virginia. Biometrics is published quarterly—in March, June, September, and December.

OFFICERS OF THE BIOMETRIC SOCIETY, 1977

GENERAL OFFICERS

President:	H. L. LeRoy
Vice President:	J. A. Nelder
Secretary:	J. S. Williams
Treasurer.	L. A. Nelson
Editor:	F. B. Cady

COUNCIL

J. Adam, *RGDR*
A. Ahrens, *RGDR*
W. K. Bauer, *DR*
A. Castillo, *Mex*
C. L. Chiang, *WNAR*
P. Dagnélie, *R. Be*
N. Mantel, *ENAR*
S. R. Searle, *ENAR*
E. Walter, *DR*

P. Berthet, *RBE*
D. Chapman, *WNAR*
L. C. A. Corsten, *A. Ned*
R. N. Curnow, *BR*
G. G. Duarte, *R. Bras*
O. J. Dunn, *WNAR*
C. W. Dunnett, *ENAR*
E. A. Gehan, *ENAR*
M. Iosifescu, *GRO*
C. D. Kemp, *BR*

J. M. Legay, *RF*
C. A. McGilchrist, *AR*
P. A. Moran, *AR*
J. A. Nelder, *BR*
T. Okuno, *GJap*
E. Ottaviano, *RItl*
C. L. Rumke, *A. Ned*
C. A. B. Smith, *BR*
R. Tomassone, *RF*
M. Turri, *RItl*
E. J. Williams, *AR*
W. J. Ziegler, *ROeS*

REGIONAL OFFICERS

Region	*President*	*Secretary*	*Treasurer*
Australian	W. B. Hall	C. J. Brien	J. B. F. Field
Austro-Swiss	E. Lengauer	L. Havelec	F. H. Schwarzenbach
Belgian	A. H. L. Rotti	G. Gerard	D. Stevens
Brazilian	R. Vencovsky	G. Torreele	D. Barbin
British	C. D. Kemp	R. M. Cormack	D. A. Holland
E. N. American	N. Mantel	C. E. Gates	C. E. Gates
French	J. M. Legay	R. Tomassone	R. Tomassone
German	H. Fink	H. Geidel	W. Haufe
GDR	G. Enderlein	D. Rasch	E. Thomas
Italian		F. Salvi	B. Chiandotto
Netherlands	L. C. A. Corsten	H. De Jonge	H. De Jonge
W. N. American	B. W. Brown	R. G. Petersen	R. G. Petersen

NATIONAL SECRETARIES

Denmark	N. F. Gjeddebaek	*Mexico*	E. Casas Diaz
Hungary	I. Juvancz	*Norway*	L. K. Strand
India	G. K. Shukla	*Romania*	T. Postelnicu
Indonesia	A. H. Nasoetian	*Sweden*	H. Wedel
Japan	K. Saio		

SUSTAINING MEMBERS OF THE BIOMETRIC SOCIETY

Abbott Laboratories
Bristol Laboratories
Carter-Wallace, Inc.
CIBA-GEIGY Limited
Eli Lilly and Company
Goedecke AG
Hoffman-La Roche & Co.
Lederle Laboratories Division,
American Cyanamid Company
Merck Sharp, and Dohme
Research Laboratories
A. Nattermann & Cie, GmbH
Parke, Davis and Company
Pfizer Incorporated
Research Triangle Institute
Roswell Park Memorial
Institute for Cancer Research
Sandoz Ltd.
Schering Corporation
Smith, Kline and French
Laboratories
Squibb Institute for
Medical Research
Tobacco Institute
The Upjohn Company
Warner-Lambert Pharmaceutical
Company
Wellcome Research Laboratories
Colorado State University,
Statistics Department
Cornell University,
Biometrics Unit
Emory University
Department of Statistics
Florida State University,
Department of Statistics
Iowa State University
Statistical Laboratory
Johns Hopkins University,
Department of Biostatistics
North Carolina State University,
Department of Statistics
Ohio State University,
Division of Statistics
Southern Methodist University,
Department of Statistics
Temple University, Department
of Biometrics
University of California at Los Angeles,
Division of Biostatistics
University of North Carolina,
Department of Biostatistics
University of Washington,
Department of Biostatistics
Virginia Polytechnic Institute
& State University,
Statistic Department

CONTENTS OF VOLUME 33

PART 1 (March 1977)

Estimation of 'safe doses' and carcinogenic experiments ..... H. O. Hartley and R. L. Sielken, Jr. 1
Combination of a preference pattern with the triangle taste test ..... W. A. Woodward and W. R. Schucany 31
Further aspects of a Markovian sampling policy for water quality monitoring
S. C. Smeach and R. W. Jernigan 41
Estimation of a simple regression coefficient in samples arising from a sub-sampling procedure
D. L. DeMets and M. Halperin 47
A pooling methodology for regression in prediction ..... J. P. Johnson, T. A. Bancroft and C.-P. Han 57
Random censoring and dendritic trees ..... G. P. McCabe, Jr. and M. L. Samuels 69
Analysis of radio telemetry data in studies of home range ..... J. E. Dunn and P. S. Gipson 85
Avoidance-modified generalised distributions and their application to studies of superparasitism
D. A. Griffiths 103
Fitting a model to the growth of yeast colonies ..... J. Gani and I. W. Saunders 113
An alternative Bayesian approach to the Bradley–Terry model for paired comparisons ..... T. Leonard 121
A general methodology for the analysis of experiments with repeated measurement of categorical data
G. G. Koch, J. R. Landis, J. L. Freeman, D. H. Freeman, Jr. and R. G. Lehnen 133
The measurement of observer agreement for categorical data ..... J. R. Landis and G. G. Koch 159
Quantit analysis: A quantal assay refinement ..... T. W. Copenhaver and P. W. Mielke 175
Quadratic analysis of reciprocal crosses ..... C. C. Cockerham and B. S. Weir 187
Comments on two different approaches to the analysis of species frequency data ..... S. Engen 205
Shorter Communications
Quick test for comparing two populations with bivariate data ..... R. K. Tsutakawa and J. E. Hewett 215
Closed expressions for the sum of an infinite series with application to quantal response assays
A. Magnus, P. W. Mielke and T. W. Copenhaver 221
Selection of polynomial terms for response surface experiments ..... S. H. Park 225
The Consultant's Forum
Query: Estimating 'heritability' of a dichotomous trait
Responses ..... R. C. Elston; W. G. Hill and C. Smith 231
Goodness-of-fit tests for discrete data: A review and an application to a health impairment scale
S. D. Horn 237
Advantages of examining multicollinearities in regression analysis ..... R. F. Gunst and R. L. Mason 249
The analysis of the two-period repeated measurements crossover design with application to clinical trials
S. Wallenstein and A. C. Fisher 261
Book Reviews 273
Abstracts 276
The Biometric Society 278
News and Announcements 279
Papers to be published in *Biometrics* 281

PART 2 (June 1977)

Sampling properties of a family of diversity measures ..... W. Smith and J. F. Grassle 283
Multiple comparisons emphasizing selected contrasts: an extension and generalization of Dunnett's procedure ..... J. P. Shaffer 293
The use of auxillary information in the design of a clinical trial ..... A. Donner 305
Sample size determinations for r × c comparative trials ..... J. M. Lachin 315
On the problem of bias in multinomial classification ..... M. Goldstein and E. Wolf 325
Estimation of linear compartmental model parameters using marginal likelihood
C. E. Minder and I. McMillan 333
Comparative Bayesian and traditional inference for Gamma-modeled survival data
A. A. Bartolucci and J. M. Dickey 343
An algorithm for Euclidean sum of squares classification ..... A. D. Gordon and J. T. Henderson 355
An application of hierarchical Kappa-type statistics in the assessment of majority agreement among multiple observers ..... J. R. Landis and G. G. Koch 363
Computing iterative weighted least squares estimates of genetic variance components
P. L. Cornelius and J. Byars 375
Shorter Communications
A simple formula for interpolating tables of χ^2 ..... R. I. Gilbert 383
A non-parametric equivalent of Williams' Test for contrasting increasing dose levels of a treatment
E. Shirley 386
The detection of random heterogeneity in plant populations ..... P. J. Diggle 390
Repeatability of threshold traits ..... J. J. Rutledge 395
Using auxillary variables for improved estimates of survival time ..... S. W. Lagakos 399
The analysis of trapping records for birds trapped in mist nets ..... B. F. J. Manly 404

A note on rectangular lattice designs ..... E. R. Williams 410
The effects of misclassification on the estimation of relative risk ..... B. A. Barron 414
Consultant's Forum
Open Query: Theoretical problems in the modified Mantel-Bryan procedure ..... D. S. Salsburg 419
Query: Estimation of seasonal total number of different households utilizing a park ..... D. S. Robson 421
Correspondence 426
Book Reviews 429
Abstracts 430
The Biometric Society 431
News and Announcements 434
Papers to be published in *Biometrics* 436

PART 3 (September 1977)

Confidence intervals and tests of hypotheses concerning dose response relations inferred from animal carcinogenicity data ..... K. S. Crump, H. A. Guess and K. L. Deal 437
An extension of the sign test for replicated measurements
M. A. Woodbury, K. G. Manton and L. A. Woodbury 453
On the treatment of grouped observations in life studies ..... W. A. Thompson, Jr. 463
A useful bivariate distribution for describing stand structure of tree heights and diameters
H. T. Schreuder and W. L. Hafley 471
Discriminant functions when covariances are unequal and sample sizes are moderate
P. W. Wahl and R. A. Kronmal 479
The estimation of heritability with unbalanced data I. Observations available on parents and offspring
R. Thompson 485
The estimation of heritability with unbalanced data II. Data available on more than two generations
R. Thompson 497
Partition of phenotypic variance under unknown dependent association of genotypes and environments
T. H. Emigh 505
Estimation for discrete time branching processes with application to epidemics ..... N. Becker 515
Shorter Communications
Assumptions for different ascertainment models in human genetics ..... J. Stene 523
An improved solution for the ultimate probability of fixation of a favorable allele ..... W. S. Cash 528
A non-parametric extension of a cluster analysis method by Scott and Knott ..... K. J. Worsley 532
Testing for Hardy-Weinberg equilibrium in small samples ..... R. C. Elston and R. Forthofer 536
Approximate relationships among some estimators of mortality probabilities ..... N. L. Johnson 542
Re-examination of the fitting of the Richards growth function ..... O. L. Davies and J. Y. Ku 546
Estimation of contrasts of log-frequencies ..... G. W. Cook 548
Estimation of relative risk from matched pairs in epidemiologic research ..... A. Ejigou and R. B. McHugh 552
An example on the risk dependence and additivity of intensities in the theory of competing risks
T. Hakulinen and M. Rahiala 557
The Consultant's Forum
Query: Designing nutrition studies with litters ..... S. M. Free, Jr. 561
Bibliography for statistical consulting ..... W. A. Woodward and W. R. Schucany 564
Circadian rhythm analysis when output is collected at intervals ..... J. H. Ware and R. E. Bowden 566
Obituary: Henry Laurence Lucas, Jr. 573
Correspondence 574
Book Reviews 576
Abstracts 577
The Biometric Society 587
News and Announcements 589
Papers to be published in *Biometrics* 591

PART 4 (December 1977)

Significance testing to establish equivalence between treatments, with special reference to data in the form of 2 × 2 tables ..... C. W. Dunnett and M. Gent 593
Monitoring treatment differences in long-term clinical trials ..... P. L. Canner 603
Applications of the Mantel-Haenszel statistic to the comparison of survival distributions
L. R. Muenz, S. B. Green and D. P. Byar 617
Sequential allocation in clinical trials comparing two exponential survival curves ..... T. A. Louis 627
The effect of errors of diagnosis and frequency of examination on reported rates of disease
J. J. Schlesselman 635
A simulation study on a Wald statistic and Cochran's Q statistic for stratified samples
G. W. Somes and V. P. Bhapkar 643

A randomization test for comparison of groups of growth curves with different polynominal design matrices ..... G. O. Zerbe and S. H. Walker 653
A growth curve model for studies in morphometrics ..... K. S. Madsen 659
A one-way components of variance model for categorical data ..... J. R. Landis and G. G. Koch 671
A comparison of three methods for the analysis of spatial pattern ..... S. Zahl 681
On extending the Bradley-Terry model to incorporate within-pair order effects ..... R. R. Davidson and R. J. Beaver 693
Order statistics of correlated variables and implications in genetic selection programmes II. Response to selection ..... W. G. Hill 703
Shorter Communications
Efficient two-replicate resolvable designs ..... E. R. Williams, H. D. Patterson and J. A. John 713
Small sample comparison of different estimators of negative binomial parameters ..... E. P. Pieters, C. E. Gates, J. H. Matis and W. L. Sterling 718
The Consultant's Forum
Pair-matching—a reappraisal of a popular technique ..... S. M. McKinlay 725
Predicting the stability of biological standards and products ..... T. B. L. Kirkwood 736
Adaptive treatment assignment methods and clinical trials ..... R. H. Simon 743
Query: On computing the Kolmogorov-Smirnov statistic ..... D. B. Campbell and C. A. Oprian 750
Responses to Open Query: Theoretical problems in the modified Mantel-Bryan procedure ..... K. S. Crump, N. Mantel 752
Obituary: Giulio Alfredo Maccacaro 758
Correspondence 759
Corrections 766
Book Reviews 768
News and Announcements 769
Papers to be published in *Biometrics* 770
Acknowledgments 771

AUTHOR INDEX, VOLUME 33

Sections	March	June	Sept.	Dec.
ABSTRACTS	276	430	577	
BOOK REVIEWS	273	429	576	768
CORRECTIONS				766
CORRESPONDENCE		426	574	759
NEWS AND ANNOUNCEMENTS	279	434	589	769
THE BIOMETRIC SOCIETY	278	431	587	
ACKNOWLEDGMENTS				771

AITKIN, M. A., (See WHITTAKER, J. C.) 585
ALBERT, A., (See LOUIS, T. A.) 581
ARMITAGE, P., Correspondence 765
BAILEY, R. C., Abstract #2469 577
BANCROFT, T. A., (See JOHNSON, J. P.) 57
BARRON, B. A., The effects of misclassification on the estimation of relative risk 414
BARTOLUCCI, A. A. and DICKEY, J. M., Comparative Bayesian and traditional inference for Gamma-modeled survival data 343
BAUER, M. and WILLIAMS, J. S., Abstract #2470 577
BEAVER, R. J., Book Review #439 273
BEAVER, R. J., (see DAVIDSON, R. R.) 693
BECK, G. W. and CHIANG, C. L., Abstract #2471 577
BECKER, N., Estimation for discrete time branching processes with application to epidemics 515
BHAPKAR, V. P., (See SOMES, G. W.) 643
BILLARD, L. and CONLON, S., Abstract #2472 577
BOWDEN, R. E., (See WARE, J. H.) 566
BYAR, D. P., (See MUENZ, L. R.) 617
BYARS, J., (See CORNELIUS, P. L.) 375
CALINSKI, T., Abstract #2473 577
CAMPBELL, D. B. and OPRIAN, C. A., Query: On computing the Kolmogorov-Smirnov statistic 750
CANNER, P. L., Abstract #2474 577
CANNER, P. L., Monitoring treatment differences in long-term clinical trials 603
CARTER, W. H., (See WAMPLER, G. L.) 584
CASH, W. S., An improved solution for the ultimate probability of fixation of a favorable allele 528
CHAO, G. C., Abstract #2475 578
CHAPUT DE SAINTONGE, D. M., Abstract #2463 276
CHIANG, C. L., (See BECK, G. J.) 577
CHOY, S. C., (See WEIR, B. S.) 585
CHU, K., (See FEARS, T.) 578
COAN, A. L. and FRANCIS, R. C., Correspondence 426
COCKERHAM, C. C. and WEIR, B. S., Quadratic analyses of reciprocal crosses 187
CONLON, S., (See BILLARD, L.) 577
COOK, G. W., Estimation of contrasts of log-frequencies 548
COPENHAVER, T. W., (See MAGNUS, A.) 221
COPENHAVER, T. W. and MIELKE, P. W., Quantit analysis: A quantal assay refinement 175
CORNELIUS, P. L. and BYARS, J., Computing iterative weighted least squares estimates of genetic variance components 375
CRUMP, K. S., Response to Open Query: Theoretical problems in the modified Mantel-Bryan procedure 752
CRUMP, K. S., GUESS, H. A. and DEAL, K. L., Confidence intervals and tests of hypotheses concerning dose response relations inferred from animal carcinogenicity data 437
CUZICK, J., Abstract #2476 578
DAVID, F. N., Book Reviews #436, #437, #438, p. 273; #442, p. 275; #447, #448, #449, #450, p. 768
DAVIDSON, R. R. and BEAVER, R. J., On extending the Bradley-Terry model to incorporate within-pair order effects 693
DAVIDSON, R. R. and SOLOMON, D. L., Abstract #2477 578
DAVIES, O. L. and KU, J. Y., Re-examination of the fitting of the Richards growth function 546
DAVIS, C. E., (See SEN, P. K.) 583
DEAL, K. L., (See CRUMP, K. S.) 437
DEMETS, D. L. and HALPERIN, M., Estimation of a simple regression coefficient in samples arising from a sub-sampling procedure 47
DICKEY, J. M., (See BARTOLUCCI, A. A.) 343
DIGGLE, P. J., The detection of random heterogeneity in plant populations 390
DONNER, A., The use of auxillary information in the design of a clinical trial 305
DRANE, J. W., OWEN, D. B. and SERBERT, G. B., JR., Abstract #2478 578
DUNN, J. E. and GIPSON, P. S., Analysis of radio telemetry data in studies of home range 85
DUNNETT, C. W. and GENT, M., Significance testing to establish equivalence between treatments, with special reference to data in the form of 2×2 tables 593
DYKE, G. V., Abstract #2462 276
EJIGOU, A. and McHUGH, R. B., Estimation of relative risk from matched pairs in epidemiologic research 552
ELSTON, R. C., Response to Query: Estimating 'heritability' of a dichotomous trait 231

ELSTON, R. C. and FORTHOFER, R., Testing for Hardy-Weinberg equilibrium in small samples 536
EMIGH, T. H., Partition of phenotypic variance under unknown dependent association of genotypes and environments 505
ENGEN, S., Comments on two different approaches to the analysis of species frequency data 205
FASHAM, M. J. R., Abstract #2460 276
FEARS, T., TARONE, B. and CHU, K., Abstract #2479 578
FEDERER, W. T., Abstract #2480 578
FISCHER, D. B. and FISCHER, J. J., Abstract #2481 579
FISCHER, J. J., (See FISCHER, D. B.) 579
FISHER, A. C., (See WALLENSTEIN, S.) 261
FORTHOFER, R., (See ELSTON, R. C.) 536
FRANCIS, R. C., (See COAN, A. L.) 426
FREE, S. M., JR., Query: Designing nutrition studies with litters 561
FREEMAN, D. H., (See KOCH, G. G.) 133
FREEMAN, D. H., (See MAKUCH, R. W.) 581
FREEMAN, G. H., Correction to "Incomplete block designs for three or four replicates of many treatments" 766
FREEMAN, J. L., (See KOCH, G. G.) 133
GALLAIS, A., Correction to "Covariances between arbitrary relatives with linkage and epistasis, in the case of linkage disequilibrium" 766
GANI, J. and SAUNDERS, I. W., Fitting a model to the growth of yeast colonies 113
GARBER, M. J., Book Review #444 429
GASTWIRTH, J. L. and SELWYN, M. R., Abstract #2482 579
GATES, C. E., (See PIETERS, E. P.) 718
GATES C. E., (See RYAN, G. W.) 582
GENT, M., (See DUNNETT, C. W.) 593
GILBERT, R. I., A simple formula for interpolating tables of χ^2 383
GILLINGS, D. and KOCH, G. G., Abstract #2483 579
GIPSON, P. S., (See DUNN, J. E.) 85
GLADEN, B., (See ROGAN, W. J.) 582
GOKHALE, V., Book Review #435 273
GOKHALE, V., Book Review #445 576
GOLDSTEIN, M. and WOLF, E., On the problem of bias in multinomial classification 325
GORDON, A. D. and HENDERSON, J. T., An algorithm for Euclidean sum of squares classification 355
GRASSLE, J. F., (See SMITH, W.) 283
GREEN, R. F., Book Reviews #440 and #441 274
GREEN, R. F., Book Review #446 576
GREEN, S. B., (See MUENZ, L. R.) 617
GREENHOUSE, S. W., Abstract #2484 579
GRIFFITHS, D. A., Avoidance-modified generalised distributions and their application to studies of superparasitism 103
GRIMSON, R. C., Abstract #2485 579
GROSS, A. W., (See WEINRICH, M. C.) 585
GUESS, H. A., (See CRUMP, K. S.) 437
GUNST, R. F. and MASON, R. L., Advantages of examining multicollinearities in regression analysis 249
HACKNEY, O. P., (See HOCKING, R. R.) 580
HAFLEY, W. L., (See SCHREUDER, H. T.) 471
HAKULINEN, T. and RAHIALA, M., An example on the risk dependence and additivity of intensities in the theory of competing risks 557
HALPERIN, M., (See DEMETS, D. L.) 47
HAN, C. P., (See JOHNSON, J. P.) 57
HARTLEY, H. O., RAO, J. N. K. and LAMOTTE, L., Abstract #2486 579
HARTLEY, H. O. and SIELKEN, R. L., JR., Estimation of 'safe doses' and carcinogenic experiments 1
HASHIGUCHI, S., Abstract #2526 586
HEDAYAT, A., Abstract #2487 580
HENDERSON, J. T., (See GORDON, A. D.) 355
HEWETT, J. E., (See TSUTAKAWA, R. K.) 584
HILL, W. G., Order statistics of correlated variables and implications in genetic selection programmes. II. Response to selection 703
HILL, W. G. and SMITH, C., Response to Query: Estimating 'heritability' of a dichotomous trait 234
HOCKING, R. R. and HACKNEY, O. P., Abstract #2488 580
HOLFORD, T. R., Abstract #2489 580
HOLLAND, M. J. C., Abstract #2490 580
HOLLIDAY, R., (See KIRKWOOD, T. B. L.) 430
HORN, S. D., Goodness-of-fit tests for discrete data: A review and an application to a health impairment scale 237
HSU, P. H., Abstract #2491 580
IGLEWICZ, B., (See MENDOZA, G.) 582
ISHII, E., (See OSAKI, J.) 586
IWAMOTO, M., (See OSAKI, J.) 586
JENSEN, A. L., Correspondence 427
JENSEN, A. L., Correspondence 575
JERNIGAN, R. W., (See SMEACH, S. C.) 41
JOHN, J. A., (See WILLIAMS, E. R.) 713
JOHNSON, D. E., Correction to "Some new multiple comparison procedures for the two-way AOV model with interaction" 766
JOHNSON, J. P., BANCROFT, T. A. and HAN, C.-P., A pooling methodology for regression in prediction 57
JOHNSON, N. L., Approximate relationships among some estimators of mortality probabilities 542
KAJITA, A., RIM, K. H. and OHTSUKA, S., Abstract #2527 586
KASPI, H., (See TURNBULL, B. W.) 584
KIRKWOOD, T. B. L. and HOLLIDAY, P., Abstract #2467 430
KIRKWOOD, T. B. L., Predicting the stability of biological standards and products 736
KOCH, G. G., (See GILLINGS, D.) 579
KOCH, G. G., (See LANDIS, J. R.) 159
KOCH, G. G., (See LANDIS, J. R.) 363
KOCH, G. G., (See LANDIS, J. R.) 671
KOCH, G. G., LANDIS, J. R., FREEMAN, J. L., FREEMAN, D. H., Jr. and LEHNEN, R. G., A general methodology for the analysis of experiments with repeated measurement of categorical data 133
KRONMAL, R. A., (See WAHL, P. W.) 479

KRUEGER, D. and MAUNDER, L., Abstract #2492 580
KU, J. Y., (See DAVIES, O. L.) 546
LACHIN, J. M., Correspondence 761
LACHIN, J. M., Sample size determinations for r × c comparative trials 315
LAGAKOS, S. W., Using auxilliary variables for improved estimates of survival time 399
LAIRD, N., Abstract #2493 580
LAMOTTE, L., (See HARTLEY, H. O.) 579
LANDIS, J. R., (See KOCH, G. G.) 133
LANDIS, J. R., (See SCHOOLEY, G. L.) 583
LANDIS, J. R. and KOCH, G. G., Abstract #2494 581
LANDIS, J. R. and KOCH, G. G., An application of hierarchical Kappa-type statistics in the assessment of majority agreement among multiple observers 363
LANDIS, J. R. and KOCH, G. G., The measurement of observer agreement for categorical data 159
LANDIS, J. R. and KOCH, G. G., A one-way components of variance model for categorical data 671
LEE, A. J., Abstract #2495 581
LEE, A. J., Abstract #2496 581
LEHNEN, R. G., (See KOCH, G. G.) 133
LEONARD, T., An alternative Bayesian approach to the Bradley-Terry model for paired comparisons 121
LINDLEY, D. V., Abstract #2524 586
LOUIS, T. A., Sequential allocation in clinical trials comparing two exponential survival crews 627
LOUIS, T. A. and ALBERT, A., Abstract #2497 581
MADSEN, K. S., A growth curve model for studies in morphometrics 659
MAGNUS, A., MIELKE, P. W. and COPENHAVER, T. W., Closed expressions for the sum of an infinite series with application to quantal response assays 221
MAKUCH, R. W. and FREEMAN, D. H., JR., Abstract #2498 581
MANLY, B. F. J., The analysis of trapping records for birds trapped in mist nets 404
MANTEL, N., Response to Open Query: Theoretical problems in the modified Mantel-Bryan procedure 755
MANTEL, N., Correspondence 759
MANTON, K. G., (See WOODBURY, M. A.) 453
MASON, R. L., (See GUNST, R. F.) 249
MATIS, J. H., (See PIETERS, E. P.) 718
MAUNDER, L., (See KRUEGER, D.) 580
McCABE, G. P., JR. and SAMUELS, M. L., Random censoring and dendritic trees 69
McHUGH, R. B., (See EJIGOU, A.) 552
McKINLAY, S. M., Pair-matching—a reappraisal of a popular technique 725
McMILLAN, I., (See MINDER, C. E.) 333
MENDOZA, G. and IGLEWICZ, B., Abstract #2499 582
MIELKE, P. W., (See COPENHAVER, T. W.) 175
MIELKE, P. W., (See MAGNUS, A.) 221
MIHRAM, G. A., Abstract #2500 582
MINDER, C. E. and McMILLAN, I., Estimation of linear compartmental model parameters using marginal likelihood 333
MINDER, C. E. and McMILLAN, I., Correction to "Estimation of linear compartmental model parameters using marginal likelihood" 767
MOHBERG, N. R., (See SCHOOLEY, G. L.) 583
MUENZ, L. R., GREEN, S. B. and BYAR, D. P., Applications of the Mantel-Haenszel statistic to the comparison of survival distributions 617
MURRAY, J. D., Abstract #2468 430
NORTON, J. M., (See WARDE, W. D.) 762
OHTSUKA, S., (See KAJITA, A.) 586
OLDHAM, P. D., Abstract #2466 430
OPRIAN, C. A., (See CAMPBELL, D. B.) 750
OSAKI, J., ISHII, E. and IWAMOTO, M., Abstract #2528 586
PARK, S. H., Selection of polynomial terms for response surface experiments 225
PARK, Y. C., Abstract #2501 582
PATTERSON, H. D., (See WILLIAMS, E. R.) 713
PICKLE, L. W., Abstract #2502 582
PIETERS, E. P., GATES, C. E., MATIS, J. H. and STERLING, W. L., Small sample comparison of different estimators of negative binomial parameters 718
PLEASE, N. W., Book Review #443 429
PURDUE, P., (See WEINER, D. L.) 585
RAHIALA, M., (See HAKULINEN, T.) 557
RAO, J. N. K., (See HARTLEY, H. O.) 579
REGAL, R. R., Abstract #2503 582
RIM, K. H., (See KAJITA, A.) 586
ROBSON, D. S. and WRIGHT, V. L., Query: Estimation of seasonal total number of different households utilizing a park 421
ROGAN, W. J. and GLADEN, B., Abstract #2504 582
ROHLF, F. J., Correspondence 763
ROUTLEDGE, G. L., Correspondence 574
RUTLEDGE, J. J., Repeatability of threshold traits 395
RYAN, G. W., GATES, C. E. and SMITH, W. B., Abstract #2505 582
SALSBURG, D. S., Abstract #2506 583
SALSBURG, D. S., Open Query: Theoretical problems in the modified Mantel-Bryan procedure 419
SAMUELS, M. L., (See McCABE, G. P.) 69
SAUNDERS, I. W., (See GANI, J.) 113
SAVAGE, J. R. K., Abstract #2465 277
SCHLESSELMAN, J. J., The effect of errors of diagnosis and frequency of examination on reported rates of disease 635
SCHOENFIELD, D., Abstract #2507 583
SCHOOLEY, G. L., LANDIS, J. R. and MOHBERG, N. R., Abstract #2508 583
SCHOR, S., Abstract #2509 583
SCHREUDER, H. T. and HAFLEY, W. L., A useful bivariate distribution for describing stand structure of tree heights and diameters 471
SCHUCANY, W. R., (See WOODWARD, W. A.) 31
SCHUCANY, W. R., (See WOODWARD, W. A.) 564
SELLERS, S., (See SEN, A. R.) 767

SELWYN, M. R., (See GASTWIRTH, J. L.) 579
SEN, A. R., SELLERS, S. and SMITH, G. E. J., Correction to "The use of a ratio estimate in successive sampling" 767
SEN, P. K. and DAVIS, C. E., Abstract #2510 583
SERBERT, G. B., JR, (See DRANE, J. W.) 578
SHAFFER, J. P., Multiple comparisons emphasizing selected contrasts: an extension and generalization of Dunnett's procedure 293
SHEY, H. M., Abstract #2511 583
SHIRLEY, E., A non-parametric equivalent of Williams' Test for contrasting increasing dose levels of a treatment 386
SHIYOMI, M., Abstract #2525 586
SIELKEN, R. L., JR., (See HARTLEY, H. O.) 1
SIMON, G., Abstract #2512 584
SIMON, R. H., Adaptive treatment assignment methods and clinical trials 743
SMALL, R. D., Abstract #2513 584
SMEACH, S. C. and JERNIGAN, R. W., Further aspects of a Markovian sampling policy for water quality monitoring 41
SMITH, C., (See HILL, W. G.) 234
SMITH, G. E. J., (See SEN, A. R.) 767
SMITH, R. L., (See TURNBULL, B. W.) 584
SMITH, W. and GRASSLE, J. F., Sampling properties of a family of diversity measures 283
SMITH, W. B., (See RYAN, G. W.) 582
SOLOMON, D. L., (See DAVIDSON, R. R.) 578
SOMES, G. W. and BHAPKAR, V. P., A simulation study on a Wald statistic and Cochran's Q statistic for stratified samples 643
SPRADLIN, C. T., Abstract #2514 584
STENE, J., Assumptions for different ascertainment models in human genetics 523
STERLING, W. L., (See PIETERS, E. P.) 718
TAN, W. Y. and WONG, S. P., Abstract #2515 584
TARONE, B., (See FEARS, T.) 578
THOMPSON, E. A., Abstract #2461 276
THOMPSON, R., The estimation of heritability with unbalanced data. I. Observations available on parents and offspring 485
THOMPSON, R., The estimation of heritability with unbalanced data. II. Data available on more than two generations 497
THOMPSON, W. A., JR., On the treatment of grouped observations in life studies 463
TSUTAKAWA, R. K. and HEWETT, J. E., Abstract #2517 584
TSUTAKAWA, R. K. and HEWETT, J. E., Quick test for comparing two populations with bivariate data 215
TURNBULL, B. W., KASPI, H. and SMITH, R. L., Abstract #2516 584
VESSEY, M. P., Abstract #2523 585
WAHL, P. W. and KRONMAL, R. A., Discrimination functions when covariances are unequal and sample sizes are moderate 479
WALKER, S. H., (See ZERBE, G. O.) 653
WALLENSTEIN, S. and FISHER, A. C., The analysis of the two-period repeated measurements crossover design with application to clinical trials 261
WAMPLER, G. L., CARTER, W. H., JR. and WILLIAMS, V. R., Abstract #2518 584
WARDE, W. D. and NORTON, J. M., Correspondence 762
WARE, J. H. and BOWDEN, R. E., Circadian rhythm analysis when output is collected at intervals 566
WEINER, D. L. and PURDUE, P., Abstract #2519 585
WEINRICH, M. C. and GROSS, A. J., Abstract #2520 585
WEIR, B. S., (See COCKERMAN, C. C.) 187
WEIR, B. S. and CHOY, S. C., Abstract #2521 585
WESTLAKE, W. J., Correspondence 760
WHITTAKER, J. C. and AITKIN, M. A., Abstract #2522 585
WILLIAMS, E. R., A note on rectangular lattice designs 410
WILLIAMS, E. R., PATTERSON, H. D. and JOHN, J. A., Efficient two-replicate resolvable designs 713
WILLIAMS, J. S., (See BAUER, M.) 577
WILLIAMS, V. R., (See WAMPLER, G. L.) 584
WOLF, E., (See GOLDSTEIN, M.) 325
WONG, S. P., (See TAN, W. Y.) 584
WOODBURY, L. A., (See WOODBURY, M. A.) 453
WOODBURY, M. A., MANTON, K. G. and WOODBURY, L. A., An extension of the sign test for replicated measurements 453
WOODWARD, W. A. and SCHUCANY, W. R., Combination of a preference pattern with the triangle taste test 31
WOODWARD, W. A. and SCHUCANY, W. R., Bibliography for statistical consulting 564
WORSLEY, K. J., A non-parametric extension of a cluster analysis method by Scott and Knott 532
WRIGHT, V. L., (See ROBSON, D. S.) 421
YOUNG, P. A., Abstract #2464 277
ZAHL, S., A comparison of three methods for the analysis of spatial pattern 681
ZERBE, G. O. and WALKER, S. H., A randomization test for comparison of groups of growth curves with different polynomial design matrices 653

INDEX OF BOOKS REVIEWED

BAUM, P. and SCHEUER, E. M., Statistics Made Relevant: A Casebook of Real Life Examples. (#435, D. V. Gokhale) 273
BECK, J. V. and ARNOLD, K. J., Parameter Estimation in Engineering and Science. (#448, F. N. David) 768
DE DOMBAL, F. T. and GREMY, F. (eds.), Decision Making and Medical Care. (#436, F. N. David) 273
GNANADESIKAN, R., Methods for Statistical Data Analysis of Multivariate Observations. (#443, N. W. Please) 429
HUZURBAZAR, V. S., Sufficient Statistics. (#437, F. N. David) 273
JORESKOG, K. G., KLOVAN, J. E. and REYMENT, R. A., Geological Factor Analysis. (#438, F. N. David) 273
KRISHNAIAH, P. R. (ed.), Multivariate Analysis IV. (#450, F. N. David) 768
LACHENBRUCK, P. A., Discriminant Analysis. (#444, M. J. Garber) 429
LI, W. H. (ed.), Stochastic Models in Population Genetics. (#446, R. F. Green) 576
MAXWELL, A. E., Multivariate Analysis in Behavioral Research. (#445, D. V. Gokhale) 576
MONTGOMERY, D. C., Design and Analysis of Experiments. (#439, R. J. Beaver) 273
SCHULTZ, V., EBERHARDT, L. L., THOMAS, J. M. and COCHRAN, M. I., A Bibliography of Quantitative Ecology. (#440, R. F. Green) 274
SOLOMON, D. L. and WALTER, C. (eds.), Lecture Notes in Biomathematics: Mathematical Models in Biological Discovery. (#449, F. N. David) 768
THOMPSON, E. A., Human Evolutionary Trees. (#441, R. F. Green) 274
TUKEY, J. W., Exploratory Data Analysis. (#447, F. N. David) 768
WILLIAMS, E. J. (ed.), Studies in Probability and Statistics. (#442, F. N. David) 275

SUBJECT INDEX, VOLUME 33

Key Words are identified by asterisk (*)

Abstracts 276–7, 430, 577–86
Abundance 209
Acceptability 585
Accuracy 520, 543
Additivity 137
  of intensities 557*
Adenocarcinoma, endometrial 416
Adjustment, Kramer 302
Adolescence 656
Advertising 31
Age 57, 142, 250, 430, 497, 657, 659
Agreement 155
  majority 363*
  measure 363*, 672
  observer 159*, 363*, 672
  strength of 165
Agronomy 434
Algebra 327, 542
Algorithm
  agglomerative 356
  classification 355
  computer 379
  design construction 713
  divisive 356
  function optimisation 106
  hybrid 360
  iterative convex programming 7, 20
  iterative relocation 357
  Powell 401
  projection 358
Allele 385, 509
  dominant 510
Allocation
  data-dependent 627*
  optimal 315*
Alternative 648
  Lehmann 623
Anaesthetic 231
Analysis
  canonical 659*
  circadian rhythm 566
  cluster 355*, 532*
  commonality 505*
  covariance 663
  data 279, 429
    exploratory 768
  decision 434
  discriminant 429
  experiment 273
  exploratory 129, 768
  geological factor 273
  growth curve 264, 566, 654
  intrablock 412
  life table 635*
  life time 463
  limitation in 725
  linit 175
  logit 175
  mixed model 581
  multivariate 566*, 576, 768, 769
  pattern 681*
  probit 175
  quadratic 187*
  quantal response assay 175*
  quantit 175, 221*
  rank 135
    multivariate 135
  reciprocal cross 187
  regression 249
  risk-benefit 25
  segregation 523*
  sequential 603, 743
  survival 343*
  trapping records 404*
  variance 135, 159, 231, 234, 398, 491, 523, 654, 671, 683
    hierarchical 504
    multivariate 135, 264, 674
    split-plot 264, 376
Animal
  breeding 528
  experimental 6, 215, 561
  nutrition 561
  twin 725
Antibiotic 736
Antigen, ragweed 453
Antitoxin, tetanus 729
A-optimality 713*
Appendices 13–21, 38–9, 45–6, 54–6, 65–7, 84, 98–101, 132, 152–8, 185–6, 199–203, 268–9, 291–2, 302–3, 313–4, 413–4, 450–1, 493–5, 545, 551–2, 633–4, 669, 702
Approximation 15, 43, 186, 543, 549
  chi-square 392
  diffusion 528
  polynomial 225
Area 266
Argentina 689
Arizona 689
Ascertainment 416
Assay, carcinogenic 583
Assay, quantal response 175*, 221
Assignment 745
Association 47, 414*, 505
  for Statistical Computing, International 590
  measure of 584
Assumption 33, 523, 585, 671
  normality 479
Asymptote 619
Author's reply 24, 575, 760, 763
Automatic interaction detection 532*
Average 35
  sample number (ASN) 627
Avoidance of superparasitism 103*
Award
  Presidents' 589
  Sheps 589
  Snedecor 279, 769

Babies 644
Background 22
Bacteria 133
Baker's yeast 114
Balance 561, 577
Baseline 267
Bayes
  approach 121
  factors 343*
  inference 343*
  risk 325
  strategy 305*
  theory 549
  viewpoint 585
Beef 497
Behavioral
  development 581
  problems 731
  research 576
Belief 122
Benthic core 286
Bias 9, 47, 57*, 69, 227, 276, 283, 548, 563, 712, 718
  exact 325*
  interobserver 159, 363
  selection 747
Bibliography 274, 564*, 693
Bifurcation 80
Bioassay 218, 548, 736
  quantal 147, 175, 578
Bioavailability 261*, 593
Biochemistry 566
Bioequivalence 596, 760
Biological products 736
Biological standards 736*
Biologists 21
Biology 430
Biomathematics 768
Biometric Society 21, 272, 278, 430, 431, 587
Biometrics 230, 430, 587
Biometry 430
Birds 85, 404
Birth 113, 523, 656
  order 730
  sequence 563
Bladder condition 250

Block 511, 682, 725
Blood
  pressure 253, 294, 570, 580
  product 736
  sugar 218
Boll weevil 722
Book reviews 273–5, 429, 576, 768
Botany 689
Bottles 699
Bound 303, 309, 325
  Glick's 326
Boundary conditions 530
Branches 69
Branchiness 71
Brand 31
Breeding 528
  value 703
Brook trout 426
Bulls, dairy 497
Bulls, Zebu 497

Calculator, desk 383
Calculus, elementary 685
Calculus of variations 3
Calibration 578, 601, 634
Cancer 1, 400, 437, 604
  breast 746
  cervical 581
  endometrial 416
  lung 622
Canonical form 481
Capture 405
Carcinogen 6, 231
Carcinoma 635
  uterine cervix 365, 635
Case-control studies 579, 580
Casebook 273
Categories, ordered 237
Causal system 508
Cause of death 6
Cell 113
  ageing of 430
  frequency 121
  human 430
  population 277
Censoring 6, 617
  random 69
  time 345, 401
  type-II 345
Center of activity 85
Centroid 355
Cervical dysplasia 635
Cervical smear 635
Chance 643
  mechanism 747
Chemical 437
Chemotherapy 584, 623
Chess tournaments 121
Chickens 659
Child Research Council 656
Children 134, 523, 730
Cholesterol 47, 267
Chromosomes 193, 277
Church 31
Circadian rhythm 566*
Circle 391
Classification 355*
  cross- 69*, 414
  errors of 415
  Euclidean 355*
  mis- 414*, 480
  multinomial 325*
Clinical
  diagnosis 159, 363
  oncology 745
  trial 4, 142, 261, 276, 305*, 434, 577, 583, 593, 617, 743*, 746
    long term 603*
    sequential 627*
Clofibrate 267
Closed form 221*
Club 31
Clustering 356, 390, 532, 681*
Cohort 635
Coin flipping 326
Colestipol 267
Colleague 583
Collection interval 567
Combat 121
Combination 31
Comments 21
Commonality 505*
Community 286, 515
  natural 287
  replicate 287
  vaccinated fraction of 518
Commuter 583
Comparative trials 315*
Comparison 14
  drug 139
  graphic 218
  equations 426
  multiple 165, 293*, 534
    Kruskal-Wallis 386*
  numerical 49, 600
  paired 121*, 693*
  pairwise 293
  precision 725
  small sample 718
  survival distribution 617
  treatment 593*
Competition 505
Completeness 14
Components 505
Computation 6, 15, 20, 43, 106, 123, 175, 291, 308, 533, 542, 581, 750
  efficient 221*, 378
  experience 15
  facilities 593
  form 485
  stability 7
  statistics 589
  time 222, 291
Computer
  CDC 35
  cost 613
  IBM 60, 181, 360, 448, 634
  time 43, 613
  Univac 613
Computer program
  BASIC 457
  BMD 182
  CLUSTAN package 359
  FORTRAN 60, 181, 359, 379, 634
  GLOBAL 448
  hypergeometric probability 292
  IMSL package 35, 292
  PL/C 697
  RANDC 719
  random number generator 35, 50, 634, 719
  RHOCAT 676
  Thomas' 598
Conference 434, 769
  Biometric 272
Confidence
  bound 419
  coefficient 594
  ellipsoid 335
  interval 1, 8, 36, 109, 288, 293, 437, 582, 594, 752, 759
    distribution-free 607
  limit 9, 598, 607, 657
  points, Fieller-type 29
  region 88, 568
Confusion 205
Conjecture 630
Connectivity 69
Consensus 369
Consent 748
Constants, physical 737
Constraint 262, 474, 584
  linear 20
  monotonicity 470
  multinomial 672
Consultants' Forum 230, 419, 561, 725
Consulting, statistical 564*
Consumer 31
Contact, social 519
Contingency table 69*, 135, 160, 395
  fourfold 395
  incomplete 121*
  multiway 548
  r × c 317
  sparse 156, 172

3×3 578
2×2 215, 593*, 617
very large 156, 172, 363
Continued fraction 186, 222
Continuity, Yates' correction for 456, 536, 593*, 648
Contours, likelihood 109
Contraceptive 581, 585
oral 635
Contrasts 293, 548*
Control group 293
Controversy 205
Convergence 43, 333
exponential 329
Coordinates, rectangular 86
Copper 228
Corn chips 37
Corollary 450
Coronary Drug Project 577, 606
Corrections to papers 766–7
Corrections, Yates' 456, 536, 593*, 648
Correlation 47, 109, 192, 234, 453, 472
canonical 89
interclass 671
intraclass 159, 231, 234, 671*, 703
rank 155
serial 579
tetrachoric 395*
Correspondence 426, 574, 759–65
Cost 305, 613, 627, 725
effectiveness 460
ethical 627
misclassification 480
Cotton arthropods 718*
Cotton Incorporated 722
Cours de vacances 434
Covariance 50, 107, 208, 308, 706
autoregressive 122
between relatives 505*
components 187
homogeneous 581
parent-offspring 485
relatives 188, 375*
sib 485
structure, Halberg *et al.* 566
unequal 479*
Covariate 463, 553, 577, 728, 748
Coyote 85
Creosote bush 682, 689
Critical
boundaries 605
region 603
values 520, 681
Criterion 335, 355
Curve 408
dose-response 437
envelope 440
expected species diversity 288
fitting 215*, 216, 333
growth 117, 264, 566*, 653*, 660
one-particle 21
plasma 266
prevalence 581
quadratic 216
response 13
survival 627
wear 660
Cycle, 24-hour 566
Cytochrome oxidase 22
Cytology, exfoliative 635

Dairy bulls 497
Dam 236, 485, 497
Data
acquisition 159
animal 419, 437
arthropod 718
auxiliary 400
bad 18
Barnett's 114
Beran's 117
binary 463
bioassay 181
bird 208
bivariate 215
case-control study 579
categorical 159, 581, 583, 671*
multivariate 133*, 159*, 363*
Causton's 546
count 681
density 681
diatom 287
dichotomous 13, 437
Dirk's 208
discrete 237
family 523*
forest stand height-diameter 471
fossil pollen count 582
Gerrard's Lansing Woods 393
hypertension 581
incidence 13
life 19
longitudinal 653, 659*
looks at 603
mice depletion 585
Monitoring Committee 612
multinomial 159, 325
multivariate 133, 325
nominal 159
offspring 485
ordinal 159
categorical 579
partially classified 70
pathologist agreement 367
Patrick's diatom 287
pooling 57
population 515
published 175
quantitative 671
radio telemetry 85*
randomly split 8
right-censored 628
Rodrigues-da-Silva *et al.* 519
Simmond's *spalangia* 110
simulated 681
smallpox 518
sparse 331, 570
species frequency 205
survival 343, 400, 577, 613, 617
tied 617
truncated 584
tumor-rate 19
unbalanced 485*, 497*
Whitmire *et al.* 231
DDT 441
Death 2, 113, 346, 523, 542, 557, 604, 617, 638, 729
Decision, correct 686
Decision making 273, 577
Deer 85
Degrees of freedom 375, 383*, 568, 654
Delaney clause 1, 21
Demographic group 134
Dendrites 69*
Density 343, 391, 464
Derivatives 7, 75, 105
Dermatone intact level 251
Design 225, 273, 561
adaptive experimental 743
balanced 672, 713*
hierarchical 485
incomplete block 261, 410
block 410, 713*
symmetric 713
change-over 133, 261*
clinical trial 305
completely randomized 261
crossover 261*, 584
cyclic 713*
dual 713
factorial 396
mating 187
incomplete block 489
optimal binary 713
linear calibration 578
optimal 578
recommended 717
rectangular lattice 410*
repeated measurement 578, 579, 580
resolvable block 410, 713*
retrospective 417
study 743*
unbalanced 671*

unused in practice 743
Detoxifying 22
Diabetes 218, 246, 604
Diagnosis 134, 160, 363
errors 635*
psychiatric 671
Diameter 682
Dieldrin 441, 753
Diet 294, 660
Difference 593, 660
genetic 659
hazard 604
mean 627
normalized squared 242
scale 33
taxonomic 659
Differential 490
Diffusion 528*
Ornstein-Uhlenbeck 85*
Dilution 453
Dimethylnitrosamine 441
Disagreement 164
Discussion 21
Disease 305, 414
Christmas 740
chronic 133, 604, 625
communicable 518
eradication 518
-free 636
heart 604
Hodgkin's 344
infectious 517
life-threatening 746
natural history 581
outbreak 518
recurrence 399
remission 399
Disorder, congenital bleeding 740
Disorder, rare 524
Distance 242, 355, 390*, 655, 682
Distinguisher 32
Distribution 227
animal utilization 87
approximate 8
asymptotic 74, 437, 568, 583, 696
augmented polynomial coefficient estimate 654
avoidance-modified 103*
beta 207, 390, 471
biomodal 473
binomial 104, 121, 232, 327, 523*, 528, 536, 548, 593, 672, 744
bivariate 71, 85, 471*
Burr 578
chi-square 60, 74, 88, 109, 154, 302, 315, 335, 383*, 392, 420, 451, 466, 480, 536, 593, 619, 644, 663, 697, 699
non-central 60, 74, 315*
compounded 654
conditional 87, 215, 472, 598
continuous 617
crude 160, 363
cumulative 2, 750
delay 747
Dirichlet 211
discrete 453*, 598, 620
bivariate 69
double exponential 175
equilibrium 87
exact 532, 606
exponential 209, 346, 401, 405, 604, 627, 638
censored 577
family 516
weighted 400
F 59, 335, 568, 663, 683
noncentral 59, 568, 664
gamma 22, 392, 471
generalized 103*
tolerance 175*
geographic 160
Gompertz 638
hypergeometric 215, 291
hypothesized 237
Johnson 471*
joint 400, 558
life 6
limiting 440
log normal 22, 207, 471
logarithmic series 205
logistic 175, 694
marginal 71, 135, 162, 401, 471, 558
maximum acceptable standard 237
mixture of 404*
multinomial 31*, 69, 237, 285, 325, 549, 671
multivariate 48
natural 683
negative binomial 207, 682, 718*
normal 8, 36, 47, 61, 175, 234, 251, 264, 295, 302, 305, 335, 383, 390, 420, 471, 532, 549, 584, 593, 682, 703, 744, 753
asymptotic 387
bivariate 85, 307, 395, 472
multivariate 121*, 325, 331, 375, 387, 439, 479, 486, 567, 653, 660
standard 619
trivariate 50
null 390, 532, 618
number of eggs 103
offspring 515
omega 177
passage time 118
permutation 533, 618
Poisson 103, 205, 682
-binomial, modified 103*
-log normal 209
posterior 343, 549
prior 121*, 307, 744
conjugate 122, 343
hierarchical 121
S_B 471
S_{BB} 471*
spatial 390*, 681*
stopped 103*
sums of exceedances 454
survival 617*
time 400
t 36, 383
bivariate 335
multivariate 295
tail of 176, 344, 596
time to tumor 1
tolerance 175*
symmetric 176
tree height-diameter 471*
trinomial 698
type III 206
uniform 175, 406, 455, 465, 605, 755
univariate 218
Weibull 471, 610, 638
Wishart 375
Z_r 606
Diurnal variation 566*
Diversity 205*, 283
Dogma, Peto's 29
Dominance 121, 511, 523
Dosage, Dose
accelerated 3
curative 175
extreme 175
increasing 386
lethal 175
median effective 175
median lethal 175
metameter 13
residual 2
response 277, 437, 579
safe 1, 420
standard 218
threshold 21
unknown 218
zero 386, 437
Doubt 516
Drift 528
Dropout 604
Drosophila melanogaster 193, 333
Drug 133, 312, 345, 386, 467, 593, 604
lipid-influencing 606
Duration 577

Ecology 205*, 276, 284
  quantitative 274
Economic evaluation 41
Economic importance 41
Economy 713
ED50 175
ED95 175
Educator 564
Effect
  additive 693
  adverse 603
  beneficial 603
  carry-over 144, 261*
  diallel 187*
  drug 142
  environmental 497
  factorial 187*
  family 704
  fixed 486, 671
  grand mean 412
  interaction 262, 650
  maternal 187*
  multiplicative 693
  observer 671
  order 693*
  paternal 187*
  period 262
  random 492, 671
  replication 412
  residual 261*, 578
  sequence 262
  side 584
  slope 147
  split-plot 135, 161
  treatment 262, 603, 660
  variety 412
  whole-plot 135, 161
Effectiveness, relative 743
Efficacy 584, 585
Efficiency 59, 103*, 485
  asymptotic 516
  factor 713*
  relative 59, 517
Egg 103
  production 333
Electrophoresis 385
Ellipse 568
Encounter 104
Endometrium 416
Endpoint 614
Energy 737
Engineering 768
Enrollment pattern 608
Enrollment, uniform 608
Entropy 289, 737
Envelope curve 440
Environment 395, 486, 505
  random 515*
Enzyme 740
Epidemic 515*
  carrier-borne 577
  influenza 625
Epidemiology 47, 159, 552*
Epistasis 486
Equations 75, 406
  approximating 43
  Arrhenius 736*
  differential 10, 426
  Dwyer 98
  Eyring 739
  Fokker-Planck diffusion 87, 528*
  inverse prediction 395
  Kolmogorov backward 528*
  likelihood 466, 696
  logistic 426, 574
  Kuhn-Tucker 20
  matrix 115
  Neudecker's 100
  non-linear 176
  normal 176, 383, 506
  quadratic 568
  regression 57
    doubtful 62
Equilibrium, Hardy-Weinberg 536*
Equivalence 595
Eradication programme 518
Error 743
  algebraic 574
  apparent 325*
  diagnostic 635
  maximum absolute 383
  measurement 159
  multiplicative 334
  never corrected 640
  round-off 43
Estimate, Estimation, Estimator 768
  alternative 516
  animal population density 586
  Bartholomew's quick 604
  branching parameters 69
  cancer risk 437*
  consistent 20, 515*
  corrected 417
  correlation 395
  digamma 718
  efficiency of 103*
  extreme dosage 175*
  heritability 485*, 497*
  interval 175
  iterative 473
  Kraus 552
  least squares 21, 59, 178, 251, 516
  linear 198
    compartmental model 333
  logit 548
  Lush's 396
  maximum likelihood 6, 20, 31, 51, 73, 80, 84, 85*, 91, 103, 153, 175*, 176, 209, 232, 330, 386, 395, 400, 420, 463, 471*, 485*, 497*, 519, 553, 568, 577, 604, 663, 669, 693*, 718, 736*, 752, 755
    constrained 1*, 20, 121, 437*
  minimum variance unbiased 283
  missing cell 580
  moment 404, 718
  monitoring of 9
  Monte Carlo 51
  mortality 542*
  negative binomial parameters 718
  non-linear 546*
  Pearson's 396
  Plackett's 396
  pooled 59, 568
  population abundance 582
  prevalence 582
  rapid 586
  ratio 676
  regression coefficient 47
  regression, non-linear 404
  relative risk 552
  repeatability 395
  safe dose 1*, 8, 437*
  shrinkage 121*
  simple 51
  trivial 285
  unbiased 48, 93, 139, 283*, 422
    almost 548*
    asymptotically 47
  usual 48
  variability of 33
  variance components 187, 485, 579
  weighted 94
  zero-class 718
Ethics, medical 625, 627, 743
Evaluation, model 249*
Evaluation, pair-matching 725*
Even-aged forest stands 471*
Evidence 743
Examination, frequency of 635
Example, numerical 43, 128, 266, 639
Example, real life 273
Exceedance 453*, 533
Exchangeability 121*
Exercise 294
Existence 84, 285
Expectation, conditional 538
Expected value 41, 704
Experiment 273
  animal 1*
  cancer 1*
  carcinogenesis 1*, 578, 583
  genetic 375
  mark-recapture 405

mixed model 133
Monte Carlo 18
repeated measurement 133*, 159*, 363*
response surface 225
simulation 437
Soler-Argilaga and Heimberg 216
split-plot 133, 379
tracer 33
weights-judging 699
Exposure time 8
Expression, closed-form 221*
Extinction 516
Extrapolation
animal to man 11, 419
low dose 437
safe dose 13, 176, 437, 752
Extreme 47, 533
Eyes 294

Failure 463, 638
False negatives 635
False positives 635
Familiarity 187
Family 235, 379, 491, 703
diversity measures 283
limitation 524
overcompensation 524
size 134
non-Poisson 585
Farrowing barn 561
Father 513
Feed 561
Fellowship, Cox 589
Female 89, 193, 216, 336, 486, 562, 659
Fertilisation 103, 471
Fibroblasts 580
Fields 276
Fitness 529
Fixation, ultimate 528*
Fleahopper 722
Florida 475
Follow-up 604, 617, 635*
loss to 636
Food 505
additive 1, 386, 437
artificial 386
mix 700
packaged 23
Food and Drug Administration 1, 419
Food, Drug and Cosmetic Act 1
Force of mortality 557
Forestry 471
Formula
Falconer's 235
Fisher's 234
Halperin 322
integration 313
interpolation 383
Lush's 710
Fraction of community 518
Fraction, continued 186, 222
Fraction, critical 519
Framingham Heart Study 47
Free fatty acid 216
Frequencies 477, 537
capture 409
log- 548*
small cell 239
Fruit flies 175, 193, 333
Function
approximating 383
concave 466
cost 627
digamma 548
discriminant 479*
linear 325
dose-response 176
exponential gain 305
generalized entropy 289
hazard 401
likelihood 743
marginal 334
monotone 655
decreasing 537
positive continuous 15
probability generating 104, 517
Richard's growth 546*
step 395, 439
survivorship 638
trigamma 548
utility 744

Gain 306
Gait 250
Gene 196, 499, 523, 537
mutant 528
General practitioner 523
Generation 379, 497, 528
overlapping 585
size 516
Generator, random number 35, 50, 634, 719
Genetics 562, 703*
human 523*
population 576
quantitative 395, 513
Genital display 121
Genotype 232, 505, 523
Geocoris 722
Geology 273
Geometric figure 298
Girls 656
Graduate student 564
Grandsire 497
Grandson 501
Griseofulvin 266
Grouping 463*
Groups 653
paired 453
Growth 113
allometric 659
human 653
Guanica State Forest, Puerto Rico 409
Guess 31

Habitat 208
Hardy-Weinberg equilibrium 536*
Harsh realities 733
Hazard 401, 638
rate 1, 5
age-specific 10
positive 5
Weibull 5
Health accounting 237
Health agency 523
Heat of activation 737
Heliothis larvae 722
Hepatic metabolism 216
Heredity 505
Heritability 231, 485*, 497*, 506, 708
Heterogeneity 390*
Hippodamia convergens 722
Histogram smoothing 121
Histology 365, 586
History 250
Hodgkin's disease 344
Home range 85*
Homogeneity 159
Homozygote 385
Hormone 736
Hospital 523
Host 103
Household 421
Hydrocyanic acid 22
Hyperplasia 365
Hypertension 23, 416
Hypolipidemics 261
Hypothesis 59
alternative 595, 648
hierarchical 170
homogeneity 136, 162
interaction 580
marginal symmetry 162
no interaction 135, 161
no interobserver bias 363
no split-plot effects 135, 161
no whole-plot effects 135, 161
null 215, 238, 343, 537, 593, 604, 643, 648, 682, 743
random censoring 71
total symmetry 135

Ignorance 346

Immunity 515
Inbreeding 379
Incidence, spontaneous cancer 2
Inconsistency 675
Independence 85, 103, 121, 206, 251, 262, 327, 392, 505, 557, 673
  quasi- 128
Index 162, 659
  expected species 283
  inconsistency, Bershad's 675
  relative merit 694
  Simpson's diversity 209, 283*
Individual 205, 517, 523, 582, 653, 681
Industrial inspection plan 743
Inequalities 7, 13
  Jensen's 518
Infant loss 730
Infection 519
  skin 134
Inference 57, 175
  Bayesian 343*
  coherent 352
  conditional 333*
  pair-matched sample 725*
  simultaneous 617*
  traditional 343
Influenza 625
Information 74, 85*
  accumulating 743
  auditory 582
  auxiliary 305*
  Kullback-Leibler 629
  minimum discrimination 156
  Shannon 283*
Informed consent 748, 761
Inheritance 523
Inhomogeneity 519
Injection, subcutaneous 457
Injury 249
Innovation 593
Insects 205
Inspection, periodic 469
Institut für medizinische Statistik und Dokumentation 280
Insulin 246
Intake 603, 625
Integral 227, 313, 566, 655
  chi-square 22
Integration 530, 654
  numerical 185
Intensity 557*
Interaction 89, 532
  territorial 85*, 89
Interpolation 383*, 641
Interval, finite 584
Interviewer 159
Invariance reduction 627
Invited paper 1
IQ scores 505
Iron 228
Iteration 696
  Gauss-Newton 738
  Newton-Raphson 320

Jack-Knife 9, 31*
Journal, medical 743
Journal of the National Cancer Institute 321

Ketone bodies 217
Kidney 218, 566
Kinetics 22
Kronecker delta 495
Kronecker product 698

Labor 726
Lady beetles 722
Lagrange multiplier 75
Larrea 682, 689
Law, Mendelian 523
LD05 175
LD50 175
League competition 693
Least squares 187, 333, 383, 546
  generalized 663
  iterative 375*
  nonlinear 334, 619
  weighted 133*, 159*, 216, 363*, 375*, 676, 693*, 738
Lemma 295, 300, 303, 357
  Wald's 630
Length 659
Liability 234
Life table 427, 463*
Lifetime 557
Light trap 205
Likelihood 6, 20, 33, 90, 109, 175, 466, 489, 552, 597, 693, 743
  abbreviation of 743
  approximations 121*
  contours 109
  marginal 333*
  principle 613
  ratio 325, 420, 663
    invariant 627
  surface 546*
Line, genetic 197
Line, regression 584
Linearization 566, 698
Literature 355
Litter 561
Liver 216
Locus 385, 509
  biallelic 523
Logarithm 57, 139
  frequencies 548*
  ratio of 147
Logic 505
Logit 147, 548*
Longitudinal study 145, 581
Loss 725, 730, 744
Lucky guesser 32

Maize 379
Majority 363*
Malawi 497
Male 89, 193, 216, 266, 486, 562, 659, 740
Mammals 405
Management 471
Manuscripts, unpublished 13
Margin 363
Marketing research 693
Markov chain 41, 529
  aperiodic recurrent 41
Markov process 41
Martingale 630
Matched pairs 552*, 580
Mating 379, 523
Matrix 116, 254, 357, 375, 655
  block concurrence 412
  block diagonal 367, 486, 699
  correlation 396
  covariance 50, 74, 93, 109, 122, 153, 180, 265, 334, 479, 486, 567, 699
    equal 325
    infinitesimal 87
  design 268
    polynomial 653
  diagonal 88, 153, 481
  dispersion 86, 661, 664
  eigenvalue 518
  error 416
  exponential 87
  Fisher information 74
  Hessian 99, 467
  identity 61, 142, 481
  information 179, 490
  inverse 495, 503
    generalized 495, 503
  latent root 254
  mean 517
  mean square 675
  misclassification 416
  operator 139, 499
    very large 156
  parentage 501
  Perron-Frobenius root 517
  positive semidefinite 7, 226
  product 672, 698
  relationship 499
  second derivatives 7
  sum of squares 675
  transformation 662
  transition probability 42

triangular 667
2×2 491, 493
Vandermonde 21
variance 226, 410*, 488
Wishart 377
Maximization, global 439
Mean 57, 103*, 105, 293, 515, 532
arithmetic 516
conditioned 287
difference 627
family 709
geometric 516, 695
ordered rank 533
posterior 121*
product 189, 375
score 139, 162
square 189, 375, 654
activity radius 85
error 52, 57*, 225*, 402
residual 58, 226
weighted 485, 516
Measure
accuracy 520
aggregation 718*
association 414*, 584
disagreement 671
diversity 283
Hurlbert's 384
Peterson's 287
Simpson's 284
Measurements 659
baseline 584
growth 653
repeated 261*
washout period 584
Medical
care 237, 273
ethics 625, 627, 743
investigations 725
laboratories 325
team 237
Medication 88, 266
Medicine 586
experimental 653
Mendelian law 523
Mental depression 134
Method
bisection 641
cosinor 566
Cox's binary data 463
Davidson and Solomon 124
distance 390*
distribution-free 532
Falconer's proband 235
Ford's 124
Gart's 598
Goodall's 681
gradient projection 448
Grieg-Smith 681
Jack-Knife 9, 155
Jerne and Perry 740
likelihood 333*
Mantel-Bryan 1
Mead's 681
mean and zero frequency 103*
moments 404*, 456
multivariate 580
Newton-Raphson 73, 124, 467, 546
nonparametric 261
Peto 30
quadrat 390
quantification 586
Sanders' rarefaction 284
Scheffé 685
scoring 179, 490
steepest descent 358
synthesis 579
unreliable 546
Zahl S 681
Methodology 230
Mice 19, 196, 218, 231, 388
Microtome 69
Milk yield 497
Minimum 20, 355
Misclassification 414*, 480
Misspecification 609
Mist net 404
Misunderstanding 205
Mixture of distributions 404*
Model
additive 506
adequacy 97
analysis of variance 671
Armitage-Doll 437
ascertainment 523*
incomplete 525
Bakker's 104
Barlow-Scheuer reliability growth 585
batch arrival 583
beta 209
bio-187
Blum-Druckrey 29
Bradley-Terry 121*, 693
branching process 113*
broken stick 207
carcinogenesis 4, 437
Chiang 558
Colton 305, 582
compartmental 4
linear 333*
components of variance 671
conditional 210
Davidson tie 695
dynamic biometric 582
dynamic system 44
Ehrenfest 88
evaluation 249*
factorial 187
Fisher 207
Gail's 558
gamma 343*
general product 16
genetic 232
geometric series 209
growth curve 659*
Hartley-Sielken 23
hazard rate 1*
Hopkins and Gridgeman 32
incompletely specified 63
invariance of 85
Leech and Healy's 660
linear 486
logistic 121*, 147, 553
log linear 322, 548, 580
logarithmic series 209
logistic 426, 463*, 548
mathematical 41, 582
mixed 159, 570, 581, 664
mortality 605
most conservative 3
multinomial 121, 156, 285, 646
multiphase cancer 11
multiple determinations 672
multiplicative 137
multistage 440
multi-trinomial 697
negative binomial 209
nested random effects 584
non-linear 653
parametric 3, 15
polynomial 225, 653
preference 32
product 1*, 28
production 426
one-particle 28
Potthof and Roy 662
purine metabolism 580
random effects 159, 671
Rao growth curve 567, 661
Rao-Kupper tie 695
realistic 748
regression 57, 147, 249
height-diameter 471
logistic 579
polynomial 225*
Rogers 105
sampling 523*
simple 570
simular 582
sinusoidal 566
static 44
stochastic 399*, 576, 693
compartment 585
survival 577
symmetric 205

tie 693
unconditional 210
unmonitored 3
Weibull 15
Zermelo 121
Molybdenum 228
Moment 104
factorial 105
Monitoring 41*, 603
Monotonicity 470
Monte Carlo 16, 28, 31*, 34, 47, 330, 390, 396, 400, 444, 479, 605, 646, 681, 727, 741
Morbidity
cumulative 640
force of 640
zero 641
Morphometrics 659*
Mortality 542*
force of 557, 604, 638
natural 8
Mothers 486, 513
Moths 208
Multicollinearity 294
Multiple sclerosis 134, 160
Mussel 384
Myocardial infarction 580
Mytilus edulis 384

National Center for Toxicological Research 19
Necropsy 6
Nerve cells 69
Neurobiology 71
Neurologic status 250
Neurologist 160
New Orleans, Louisiana 160
News 279, 434, 589, 769
Nicotiana rustica 194
Nitrogen mustard 344
Noctuidae 208
Non-normality 64, 584
Nurse-practitioner 593
Nutrition 561

Obituary
Henry Laurence Lucas, Jr. 573
Guilio Alfredo Maccacaro 758
Observer 159
reliability study 671
Observational study 635*, 726
Observations 187, 643
censored 343, 399*
delayed 747
grouped 463
instantaneous 747
matched 643
missing 69*
multivariate 429, 653
ordered 750
tied 463
Odds ratio 343, 582, 599
Offspring 113, 187, 218, 485, 497
Oncology 745
Ontogenesis 659
Operational content 21
Opinion 271
majority 369
Optimality 713*
Optimization 308, 466
Oral contraceptive 580
Ordering 237
hierarchical 414
within pair 693
Orius 722
Orono, Maine 208
Orthogonality 491
Outliers 762
Output 566
Oviposition 103

Pair matching 725*
Pair, ordered 76, 693
Paired comparisons 121*, 693*
Paired groups 453
Paper, Fisher's 206
Paper, genetics 576
Papers to be published 281, 436, 591
Parameter 6, 517, 765
decay 334
fitting 471*
gamma 343
genetic 487
growth 334
intercept 147
Malthusian 519
noncentrality 253, 315
nuisance 9, 627
random 580
scale 334, 343
space 7
Parasite 103
Parent 113, 187, 218, 485, 497, 710
Parity 113*
Park 421
Partition 355, 532, 663
of variance 505*
Pathology 11, 363
Pathway 499
Patients 142, 160, 249, 603, 617
cancer 400
cardiac 294
care 593
enrollment 603
Hodgkin's disease 344
horizon 743*
mobility 249
number of 632
Patterns, enrollment 608
Patterns in fields 276
Patterns, spatial 390, 681*
Peaks 683
Penetrance 523
Percentage, extreme 175
Percentage points 109
Percentile 473, 606
Performance 479
Perimeter 765
Period, infectious 519
Pesticide 386
Pharmaceutical products 738
Pharmacokinetics 333
Pharmacology 277
Phenotype 395, 703
Phosphoglucomutase 384
Physician 249, 593, 746
Physiology 69, 566
Pigs 561, 660
Pillsbury Company 700
Pinus echinata Mill. 475
Pivotal condition 294
Pivotal quantity 343
Placebo 318, 604
Plan, industrial inspection 743
Plane 215
Plant 379, 390
breeding 528
cotton 718
Plantation 475
Play the winner 743*
Plot 682
probability 251
residual 249
split 379
whole 379
Policy, tax expenditure 134
Pollen 355, 453, 582
Pollution 582
Polycyclic aromatic hydrocarbons 22
Polygon 85
Polynomial 14, 383, 397, 437, 653
Pooling 57*
Population 2, 415, 479, 557, 567
best 584
bird 404
cell 277
dichotomous 582
finite 285, 528, 684, 703
fish 427
growth 426, 574
human 725
monoecious 528
natural 505
nonhomogeneous 280
plant 390
random mating 232, 510

small 703*
sub- 134
Potato chips 31, 37
Potency 175, 736
Poultry 333
Power 44, 241, 315, 387, 603, 681
comparison 648
Precision 227, 725
Predictability 747
Prediction 57*, 249, 736
inverse 395
Predictor 57
Preference 693
conditional 31*
order of 122
pattern 31
Pregnancy 645
Presentation 693
Presidential candidate 134
Prevalence 582
age-specific 577
Preventing major epidemics 515*
Primary sampling unit 523
Principle, sufficiency 15
Probability 42, 103, 217, 237, 275, 285, 383, 405
agreement 163, 672
birth 113
cell 72, 139, 646
conditional 31, 176, 465, 525, 636, 686
correct decision 681
death 113, 523
error 743
exact 578
excedence 533
extinction 517
generating function 104, 517
inclusion 87
marginal 135, 646
misclassification 326, 480
mortality 542*
preference 694
prior 325
selection 523
state 325
subjective 465
survival 605
transition 5, 42, 77
vector 285
Proband 235, 524
Probit 3, 13, 420
Procedure
adaptive sequential 584
backward elimination 251
best subset 254
Dunnett's 293*
early stopping 617*
Gibbons' 751
Grizzle, Starmer and Koch 172
Halperin 315
Hartley-Seilken 438
Mantel-Bryan 438, 752
modified 419
multiple comparison 534
Newman-Keuls 534
Newton-Raphson 123, 179, 320
optimal classification 325
pseudo-sequential 624
randomized decision 536
robust adaptive 64
Scheffé 165, 293
sequential 63
stopping 617
Tukey's 293
two-stage 390
variable sampling ratio 41
Process
autoregressive 503
branching 515*
multitype 515*
random environment 515*
cancer induction 5
competitive 681
decision 586
demographic 681
environmental 681
epidemiologic 579
Galton-Watson 575
Gaussian 85
multivariate autoregressive 91
Markov 41*, 85
semi- 585
Matérn 391
multivariate Ornstein Unlenbeck (M.O.U.) 86
Poisson point 390
stochastic, stationary ergodic 517
subcritical 515
Producing ability 395*
Product, Kronecker 412
Progeny 197, 497
Programme, genetic selection 703
Programming, convex 7
Programming, nonlinear 7, 318, 355*
Proof 303
Proportion, observed 31
Proportion, spontaneous tumor free 8
Prostaglandin (PGE) 568
Protein 737
Protocol 6, 21
Pseudo-random numbers 396
Pseudovalue 34
Public health 518
Pulpwood 471
Purine metabolite flow 580

Quadrat 681
Quadratic form 480, 568, 655
Quaker Run Valley 208
Quality 593
assurance 237
control 41*
water 41*
Quantit 175*, 186
Quarantine officials 175
Query 231, 421, 750
open 419, 752
Questionnaire 325
Quota 684

Radiotelemetry 85*
Radiotherapy 579
Ragweed pollen antigen 453
Random
heterogeneity 390
number 50
normal 396
uniform 605
sample 49
variable 72
Randomization 454, 747
adaptive 583
blocked 622
Rank 533, 703
sum 386, 533
Ranking 122
Rate
birth 426, 574
capture 405
change 668
death 57, 426, 574, 638
disease 635
enrollment 604
error 325
excretion 567
failure 465
flow 333
hazard 2, 604
mortality 603
proportional failure 463*
spontaneous incidence 3
survival 155
Rater 159
Ratio
expected survival 627
likelihood 325, 420, 663, 747
invariant 627
mean square error 403
odds 343, 732
variable sampling 41
Rats 216
Reaction
-diffusion systems 430

erythematous 453
first-order 737
wheal-area 453
zero-order 737
Recapture 91
Reciprocal crosses 187*
Records 422, 488
Rectal status 250
Rectangle 682
Region 525
British 276, 430, 585
critical 603
ENAR 278, 577
French 279
Japanese 586
Österreich/Schweiz 280
WNAR 279
Register 525
Regression 57*, 226, 463*, 485, 506, 566*, 705
biased 249
coefficient 226, 540
simple 47*
doubtful 62
latent root 249*
linear 57, 216
mean 472
median 471*
multiple 60, 139, 738
nonlinear 333*
polynomial 653
quadratic 216
sinusoidal 566
toward mean 580
Regularity 689
Regulatory agency 25
Regulatory policy 437
Rejection value 647
Relationship
approximate 542
autoregressive 122
client-consultant 564
dose-response 579
empirical 471
height-diameter 471
interpersonal 564
linear logistic 122
Relative 498, 513
efficiency 59
risk 414*, 552*
Reliability 671
observer 159
Remission 636
Renal glomerulus 586
Repeatability 395*
Replicate 411, 453, 561, 713
Resident 404
Residuals, examination of 682
Residuals, plot of 249
Respiration 22
Response 305
Bernoulli 745
category 137, 671
curve 13, 175
difference 744
normal 745
query 232*, 422, 750, 752
alternative 234
stress 586
surface 225*, 397
time 603
vector 567
Retrospective studies 552*
Ridge 546
Risk 306, 437
background 437
Bayes 307
benefit 25
carcinogenicity 752
competing 557*
dependence 557*
human cancer 437
permissible 10
relative 414*, 552*, 640
set 469
variation 614
Robustness 9, 18, 63, 390, 515, 579, 603*, 608, 685, 747
Room for improvement 691, 748
Roots of unity 221
Round robin 121, 693
Rubber 534
Rule
actuarial one-half 469
Bayes 311
Cochran's 239
conjectured optimal 628
decision 605, 746
Flehinger-Louis 631
likelihood ratio 325
multiple decision 624
of thumb 712
Roscoe and Byars' 240
sample based 325
square root 315
stopping 605
sequential 744
trapezoidal 266
treatment assignment 627

Saccharomyces cerevisiae 114
Sacrifice 2
time of 11
Safe dose 1*
Safety 585
evaluation 21
margin 175
Salt 23
Sample 47, 595
matched 643
pair- 725*
parallel 209
path 87
random 237, 283, 422
size 41, 48, 315*, 333, 345, 479
allocation 293
expected 42, 241
variance of 42
small 47, 283, 536, 718
stratified 643*
sub- 47, 286
supplemental 72
Sampling 31, 41*, 523, 554
acceptance 746
double 241
fraction 50
plan 41, 718
play-the-winner 743*
plotless 390
policy 41
properties 283
random 49
sequential 718
sub- 47
restricted 47*
two-stage 241
unit 523
São Paulo, Brazil 515
Savings 625
Sawtimber 471
Scale 728
clustering 689
continuous 234
health impairment 237
L-point 162, 363
logarithmic 139
ordinal 137
Scaling 276, 583
Schistosomiasis 577
School 519
Science 768
Score, IQ 505
Score, mean 139, 162
Screening 582, 635*
policies 581
Scymnus cinctus 722
Sea urchin 103
Seal 121
Search 88, 103, 178, 222, 713
Season 486
Seed 713
Selection 47, 528*, 584
differential 703
genetic 703*
index 703*
natural 582
response 703

subsample 47
variables 225*, 249*
Semaine d'étude 434
Seminar 280
Senate 134
Senescence 430
Sensation 694
Sensory discrimination 693
Sensory perception 31
Sequence 143, 261
Sequential match 726
Sequential procedure 63
Series 186
infinite 221*
Maclaurin 221
power 439
sum of 221*
Taylor 155, 178, 407, 568, 671
Sex 216, 250, 486, 497, 561
Shape 659, 682
Shelf-life 736
Sib 236, 703, 730
covariance 485
full- 485
half- 485, 497
Sibship 523
Significance level 240, 537, 569
descriptive 683
expected 648
Significance, medical 628
Simplicity 726
Simulation 35, 239, 440, 478, 582, 603*, 627, 643, 718*
Sire 236, 485, 497
Size 659, 682
Slope 3, 13
positive 21, 437
zero 22
Smallpox 515
Smokers 644
Social contact 519
Soft drink 31
Southeastern Cancer Study Group 344
Space 355, 390
Sparseness 331
Species 681
abundance 205
dispersion 718
diversity 283*
frequencies 205*
rare 283
Sperm 103
Spiders 722
Spinal Cord Injury Registry 249
Square 393
Squirrel monkey 121
Stability 210, 736*
thermal 736*
Stand, forest 471
Standard
biological 736*
Blood Coagulation Factor IX 740
deviation 673
error 109, 208, 234, 404, 520, 678
State 42
absorbing 640
Statistic
agreement 363
approximate t 9
Bhapkar 644
chi-square 109, 536, 595, 617
minimum modified 75
terminal 617
Cochran's Q 643*
decision 309
F 689
goodness-of-fit 142, 381
jackknife 31
kappa 159*, 363*, 673
-type 155, 672
Kolmogorov-Smirnov 584, 750
Kruskal-Wallis H 533
likelihood ratio 75, 239, 532
logrank 617*
Mann-Whitney 648
Mantel-Haenszel 617*
model adequacy 568
order 15, 211, 703*
extreme 703
Poisson index of dispersion 690
Q 227
R^2 249
rank 617
rank sum 386
sufficient 9, 123, 273, 347, 699
complete 285
minimal 519, 695
summary 249
t 36, 251, 386
noncentral 253
T^2 390
test 386
asymptotic 643
contrast matrix 152
Tukey 302
Wald 75, 643*
Wilcoxon rank-sum 533
Wilks' lambda 539
Statistician 583
Statistical consulting 564*
Statistics 273, 275
computational 589
Steady state 261
Strain 231, 659
Strata 643
Strategy, Bayes two-stage 305*
Streams 43
Stress 586
Study
follow-up 635*
international collaborative 306
observational 635*, 726
prospective 552*, 726
retrospective 415, 552*, 726
Subjectivity 683
Subjects 261, 367, 453, 603
Substance 333
Success 643
Sum of squared distances 654
Sum of squares 189, 232, 249, 355*, 506
minimum 546
regression 377
residual 570
Summation 537
Summer session 279
Superparasitism 103*
Support interval 582
Supreme Court 134
Survey 159
Survival 343*, 465, 729
curve 627
rate 155
Survivor 605
Swansea Bay, Wales 384
Symmetry 554
marginal 141
total 135
Symposium 279, 589, 769
Symptoms 729

Tables
British Association Mathematical 548
chi-square 383
exact Hardy-Weinberg 541
life 427, 635*
Tangents 568
Taste 31
Technique, popular 725
Temperature 570, 737
Tensite strength 534
Territorial interaction 85*
Test 293, 578, 627*
accelerated degradation 736*
adequacy 662
approximate 238
asymptotic 539
Bartholomew's 387
Bartlett 392
Besag and Gleaves 390
binomial 593
Bliss and Owen 718
calibration of 601
carcinogenic 1*, 437
carryover effect 261

Chapco 536
chi-square 69*, 115, 237*, 315, 322, 376, 593
  modified 74
comparing proportions 610
conservative 192, 534
convergence 377
correlated proportions 363
Dunnett's 387
equality of populations 215
equality of preference 697
equality of proportions 643
exact 237, 654
  Fisher's 215
  Haldane's 536
F 506, 584
gap 762
Gart's 593
goodness-of-fit 142, 153, 180, 237, 409, 444, 477, 536, 697
heterogeneity 390
Holgate's ratio 390
homogeneity 317, 718
Hopkins' 390
independence 80, 322
interobserver bias 159
interval specific 653*
Kolmogorov-Smirnov 237*, 477
  discrete 244
laboratory 134
likelihood ratio 73, 237*, 392, 437*, 466
marginal homogeneity 165
McNemar 363
multinomial 237*
multivariate 261
  randomization 653*
nonparametric 215*, 261, 386*
  progressively censored 583
normal approximation 601
one-tailed 596
order effect 701
permutation 653*
preference 31, 693*
preliminary 57*, 261, 390
quick 215
randomness 390*
  of censoring 69
rank 453*
  two-sample 176
screening 582
sequential probability ratio 627
serial correlation 579
sign 453*
  extended 453
significance 593*
  objection to 743
  repeated 603*
small samples 536*
  sterilization 175
  T^2 390
  taste 31*, 693
  trend in proportions 322
  triangle 31*
  two-sided 537
  two-tailed 596
  uniformly most powerful unbiased 536
  variance components 187
  Wilcoxon 386
    two-sample 613
  Williams' 386*
  Z^M 605
Tetanus 729
Textbook 244
Theorem 295, 300, 516
  Athreya and Karlin 522
  central limit 608
  Chung 522
  Heyde 522
  Kesten and Stigum 522
  Mitra 316
  proof of 522
  Rao-Blackwell 286
  stochastic epidemic threshold 518
  Wald Wolfowitz limit 387
  Weierstrass 15
Theory
  asymptotic 450
  Bayes 549
  central limit 136
  diffusion 528*
  kinetic 25
  Markov chain 43
  Neyman-Pearson 743
  renewal 44
  target 22
Therapeutics 175
Therapy 344, 618
  adjuvant 622
Thinning 471
Thiosulfate 22
Threshold 437
  trait 395*
Throat Cultures 133
Thyrotoxicosis 331
Ties 388, 453, 463, 534, 617
Time 42, 118, 133
  capture 409
  censored 347, 469
  computer 42, 222
  delay 42
  discrete 463, 515
  exposure 8
  flowering 194
  interval 654
  life 463
  measurement 653
  reaction 388
  response 603
  savings 625
  sleeping 231
  stopping 42
  survival 347, 399*, 605
  to death 605
  to tumor 6
Tolerance 8, 19
Topology 69
Tournament 121, 693
Toxic effects 22
Toxicity 386
  relative 746
Trait
  common 524
  multiple 581
  quantitative 703
  threshold 395*
Transformation
  arcsine square root 232
  canonical 664
  exponential 154
  Freeman-Tukey 689
  linear 154, 375
  linearizing 698
  logarithmic 176, 334
  logistic 121
  matrix 662
  orthogonal 187
  polar coordinate 566
  variance stabilizing 718
Trap avoidance 405
Treatments 261, 293, 315, 386, 584
  assignment 743
  better 627
  comparison 593*
  differences 603
  discontinuing 604
  equivalence 593
  medical 627
  winning 305
  wrong 305
Tree 69*
  dendritic 69
  diameter 471
  height 471
  hickory 393
  human evolutionary 274, 276
  maple 393
  oak 393
  pine 475
Trials
  animal nutrition 561
  balanced 617
  Burlington nurse-practitioner 594
  clinical 4, 142, 261, 276, 305*, 434, 577, 583, 593, 617, 743*
    long term 603*

sequential 627*
crossover 584
health care 593
multi-institution 747
National Breast Cancer Surgical Adjuvant 746
sequential medical 743
statutory crop variety 713
stopping 604
Triglyceride 267
Trinity River, Texas 722
Tumor 231, 419, 437
bladder 19
Twins 89, 236, 725
2-acetylamino fluorine (2-AAF) 19

Uncertainty 63, 118
Uniqueness 7, 84
United Kingdom 713, 765
University
California at Davis 689
East Anglia 113
Georgetown 279
Group Diabetes Program 612, 746
Harvard 279
Iowa State 60, 279
Kentucky 644
Maryland 613
South Carolina, Medical 249
Southampton 668
Southern Methodist 564
Yale 733
Unmatchables 726
Urine 567
Uterine cervix 365

Vaccination 518
Vaccine 736
Variables
auxiliary 399*
Bernoulli 450
best subset of 225
concommitant 343
confounding 730
correlated 703
dependent 47
explanatory 121
independent 47
indicator 366
intervening 730
number of 479
predictor 249, 533
random 327, 618
response 134, 162
ordered 583
selection 225*, 249*
Variability 33, 288
IQ 505
observer 160, 363
Variance 35, 45, 105, 209, 283, 308, 333, 405, 488, 520, 532, 548, 581, 645, 671, 706
additive 497
asymptotic 31*, 47, 554, 604, 740
average 225, 507
pairwise 410*
between 666
components 159, 187*, 287, 375*, 671*
additive 505
genetic 232, 375*, 486
hypergeometric 618
jack-knife 34
maternal 187
matrix 226, 410*, 488
moment 408
partition of 505*
paternal 187
phenotypic 497, 505
prior 126
ratio 683
residual 386
sample size 41, 45
unconditional 49
Variate, environmental 517
Variate, standard normal 520
Variation
calculus of 3
coefficient of 333
diurnal 566
genetically determined 187
interindividual 566
maternally determined 187
sampling 288
Variety 411
Variola minor 519
Vector 61, 567
Veneer 471
Veterans Administration 701
Vila Guarani, São Paulo, Brazil 519
Vinyl chloride 441
Volume 303, 471
Volunteer 266

Walking 250
Wanderers 404
Washout period 266
Water quality 41*
Wave phenomena 430
Weather 519
Weight 135, 163, 218, 644, 699, 741
Width 659
Wildlife 85
Winner 743*
Winnipeg, Manitoba 160
Women 134, 640
pregnant 644
Worth 694

Yates' correction for continuity 456, 636
Year 43, 486
Yeast colonies 113*
Yellowthroat warbler 93

Zea mays L. 379
Zebu bulls 497
Zero cell frequencies 121*, 156, 364
Zero force of mortality 641
Zero level 21, 386